ORIGINAL ARTICLE

The effects of educational intervention on improving the lifestyle of osteoarthritis patients undergoing total knee arthroplasty

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ABSTRACT

Lifestyle affects health and life expectations and care training programs are attempts to change patients' lifestyles. The study aims to evaluate the effects of educational intervention on the lifestyle of patients with knee osteoarthritis. In this clinical trial, 60 patients with knee osteoarthritis were studied before and after total knee arthroplasty. Before surgery, health-promoting lifestyle profile II (HPLP II) was completed for all patients. Then the patients attended educational programs about aspects of lifestyle before undergoing total knee arthroplasty (TKA). Three months after the surgery, the questionnaire was again completed for all patients. Finally, the obtained data were analyzed statistically. The mean score of the components of health responsibility (19.6 ± 4.9 vs. 27.4 ± 4.8), physical activity (13.1 ± 4.2 vs. 24.1 ± 4.2), nutrition (21.6 ± 4.1vs. 25.8 ± 7.5), self-actualization (21.3 ± 5.9 vs. 26.3 ± 5.4), interpersonal support (19 ± 5.4 vs. 28.3 ± 5), and total mean of HPLP II questionnaires (126.7 ± 21.2 vs.151.3 ± 18) significantly increased after the training ($p<0.05$). However, the education program did not improve the mental stress management component (18.8 ± 4.3 vs. 19.3 ± 3.4 $p=0.479$). Educational intervention can improve the lifestyle of patients with knee osteoarthritis after total knee arthroplasty. These training programs are ineffective in improving stress management components and should be further investigated by future studies. The present study provided significant findings on education and improving lifestyle. The findings of this study provide a new vision for policymakers to reduce health problems by refining lifestyles.

Key words:
educational program; lifestyle; healthy aging; osteoarthritis; total knee arthroplasty; quality of life

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INTRODUCTION

Osteoarthritis (OA) is a common degenerative disorder of articular cartilage associated with hypertrophic bone changes. The risk factors include gender (more common in women), chronic trauma, age, and obesity. One of the most common symptoms of osteoarthritis is joint pain. The pain increases with activity or after a period of rest, which is called the jelly phenomenon. Osteoarthritis can be accompanied by morning fatigue, which lasts less than 30 minutes; while in rheumatoid arthritis it lasts 45 minutes or more. Patients may report both joint instability and joint locking. These symptoms reduce the patient's performance and limit activities due to joint pain and stiffness. The joints of the hands, knees, hips, and spine are the most common joints that are injured but not jointly involved. Osteoarthritis often occurs asymmetrically. The patient may have severe and debilitating osteoarthritis in one knee but not in the opposite knee. Physical examination is one of the most important diagnoses. Pain and limited mobility are common in all forms of osteoarthritis. However, each joint has its own unique physical specifications. Because osteoarthritis is primarily a clinical diagnosis, physicians can confidently make their diagnosis based on the patient's history and physical examination. Plain radiography can help confirm the diagnosis and rule out other conditions. Advanced imaging, such as CT scans or MRIs are rarely needed unless there is a problem with the diagnosis or strong suspicion of another cause such as meniscus injury.[1, 2]

The OA is accompanied by severe progressive pains, joint stiffness, decreased performance, and reduced quality of life of the patient. The knee is the most common joint that is affected by OA. It is estimated that 40% of people over 70 years old worldwide suffer knee osteoarthritis. The diagnosis, treatment, and consequences such as disability are a heavy financial burden on the patient, family, and society.[3] The knee OA prevalence in urban and rural areas of Iran is 1.4% and 19.3%, respectively.[4] Total knee arthroplasty (TKA) is a total surgical technique of knee OA featured with reduced pain and improved performance of patients, followed by improving the quality of life.

The World Health Organization (WHO) states that osteoarthritis is an age-related disease and is a significant cause of disability in middle-aged and older people.[5] More than half of the world's people over the age of 65 suffer from changes in the knee joint that indicate osteoarthritis, which accounts for more than half of health problems in this age group. It is estimated that 40% of people over 70 years old suffer from knee osteoarthritis. Due to the high prevalence of osteoarthritis, diagnosis, treatment, and consequences, such as disability, are associated with a heavy financial burden on patients, families, and society.[6]

The TKA is one of the most complex and essential procedures in orthopedics that can pose severe risks to patients' health and life. It is necessary to perform it only when the pain and deformity caused by osteoarthritis of the knee cause severe disorders in lifestyle and quality of life. As a result, given the risks of the surgery and its high cost, it is natural for patients to have high expectations of improvement of their lifestyle after surgery, which may not be met in some cases. Previous studies have shown that this treatment method is associated with limitations and problems.[7] However, it should be noted that there are still many problems associated with TKA that can be particularly influential on subjective outcomes and patients' satisfaction with surgery. In total, 11.19% of patients are not

satisfied with the results of TKA.[8] Moreover, reduced proprioception, increased risk of falling[9] , and chronic knee pain after surgery (8% to 34%) can be very irritating.[10]

In addition, limited longevity of the prosthesis may have substantial adverse impacts on the lifestyle of active and young patients.[9] Thus, it is clear that the favorable clinical and radiological findings and performance after TKA do not necessarily improve the entire patient's lifestyle. Smoking, physical inactivity, unhealthy diet, obesity, and other lifestyle behaviors are associated with the development of many diseases.[11] Researchers have noted that a healthy diet, avoiding alcohol and smoking, and adequate physical activity decrease the mortality rate.[12] Behavioral changes have an impact on overall mortality.[13] A study on Italian adults found that a combination of healthy diet, not smoking, and physical activity was associated with a reduced risk of death.[14] Capodaglio claimed physical activity was one of the critical therapeutic tools for patients, increasing the patient's quality of life.[15] Currently, limited information is available regarding the effects of TKA on lifestyle and its various aspects. For example, a few studies have examined knee arthroplasty's effects on sleep quality.[16] In some cases, only the acute period after surgery is investigated and there is no information about long-term follow-up.[17] Despite this lack of information, improving lifestyle is emphasized and considered in modern medicine. Scientific evidence has shown that individuals' lifestyle patterns affect their health and longevity. The leading cause of death and disease in modern societies is incorrect lifestyles such as lack of exercise, bad dietary habits, smoking, and inadequate physical activity. Having a healthy lifestyle can prevent many diseases. One of the essential tools for changing the patient's lifestyle is an educational program as a part of care.[18] A few studies have shown favorable results of educational interventions in terms of improving patients' lifestyles.[19] For example Coleman et al. conducted a study on self-management for osteoarthritis and the results showed that pain, function, and quality of life improved after self-care training.[20] However, Aydin et al. examined the effects of preoperative education on patients undergoing knee or pelvic replacement surgery. The results showed that preoperative education had no effect on postoperative outcomes except for a significant reduction in preoperative anxiety.[21]

Nevertheless, sufficient evidence is necessary for proving the effectiveness of this type of intervention to convince nurses and physicians to include such a program in patients' care and treatment plans. Accordingly, given the existing information gap and the need to raise awareness of the medical community, the effects of educational intervention on improving the lifestyle of osteoarthritis patients undergoing TKA were examined.

METHODS

The effects of lifestyle skills training on patient lifestyle were examined. This quasi-experimental study was done as a before and after clinical trial evaluation. The participants were selected through purposive sampling. The questionnaires were distributed to all patients who wished to cooperate in the study. The statistical unit of the hospital selected by the Social Security Organization reported an average of about 70 patients per month in two orthopedic wards. Cochran formula and Morgan's Table were used to determine the sampling size, and 60 patients referred to a selected social security hospital for knee replacement surgery within a month were entered into the study. Patients hospitalized in orthopedic wards and for knee replacement candidiasis that had no mental problems and were willing to cooperate were included in the study. The ethical

approval for the publication of this study was obtained from Islamic Azad University Medical Branch of Tehran. Before the study, the patients were asked to sign a written consent form. Patients who did not wish to participate in the plan or did not have reading and writing literacy were excluded. Moreover, patients with mental problems were excluded. The health-promoting lifestyle profile II(HPLP) was used to collect the data. The validity and reliability of the tool have been reviewed and approved by other studies.[22] This questionnaire has two parts namely demographic data and a standard questionnaire of health-promoting behaviors. It is designed based on Pender's health-promoting pattern and is a modified version of HPLP designed by Walker et al. This questionnaire contains 52 questions and is designed to measure health-promoting behaviors (diet, exercise, responsibility for health, stress management, interpersonal support, and self-actualization). The items were designed based on Likert's four-point scale (1= never, 2= sometimes, 3= often, and 4= always). This questionnaire was distributed among qualified patients in two stages .

Stage 1 : Before the training and surgery, the questionnaires were distributed among patients. The training process began during hospitalization and after receiving the first questionnaire. Johnson et al. stated that oral instruction is better than written instruction.[23] For training, educational pamphlets and five sessions of one and a half hours were used face-to-face and directly. Face-to-face training positively affects the patient as it enhances the relationship between nurse and patient. Close connections between instructor and learner increase learning.[24] The content of the training sessions included nutrition and physical activity, health responsibility, mental stress management, interpersonal support, and self-actualization sessions.

Stage 2: The second stage questionnaire was distributed to the patients three months after knee replacement surgery and training. Patients were first given knee replacement surgery three months after knee replacement surgery. The second stage questionnaire was distributed to the patients after the training. Hence, the patients were asked to refer to the hospital three months after discharge from the hospital in order to re-evaluate and complete the questionnaire. The obtained information was analyzed after data collection using SPSS (v.22). The total score is equal to the sum of the scores of all items. In addition, to obtain the total score of the questionnaire, the total scores of all questions were summed. Thus, the total score of the questionnaire varies between 52 and 208 and a higher score indicates a person's better situation. Quantitative data were presented as numbers and percentages and quantitative data were presented as mean ± SD. Descriptive statistics (preparing tables, graphs, absolute and relative frequency distribution, mean, standard deviation, etc.) were used to describe the data. Cronbach's alpha $\alpha > 0.7$) supported the reliability of the questionnaire. The normality of data distribution was assessed using the nonparametric Kolmogorov-Smirnov test ($p < 0.05$).

RESULTS

A total of 49 women (81.7%) and 11 men (18.3%) were assessed. Fifty-three patients were married (88.3%). In terms of education, it was found that 96.6% of patients had no college education. Forty-seven patients were housewives (76.6%), 13 patients were retired (21.6%), and one was an employee. In addition, 36.7% of patients had a monthly income of 260 -500 US$ and 35% had an income of less than 250 US$. Fifty patients (83.3%) had their

own houses. Fourteen patients stated that they had no information about osteoarthritis (23.3%) and thirty-seven people (61.7%) announced that they had learned about this disease through television programs. Other patients had gained information from other sources. In total, 56.7% of patients had a family of 1-3 members, and 20% had a family with seven members or more. Comprehensive comparisons and different items of HPLP questionnaire showed that after treatment and during desired training, patient's lifestyle was significantly improved in terms of all the components of HPLP questionnaire except for the mental stress management component (Table 1).

Table 1: Comparison of scores before and after the training of the HPLP questionnaire lifestyle components

Component	SD Before the Intervention	SD After the Intervention	P value
Responsibility for health	19.6±4.9	27.4±4.8	< 0.001
Physical activity	13.1±4.2	24.1±4.2	< 0.001
Nutrition	21.6±4.1	25.8±7.5	0.001
Self-actualization	21.3±5.9	26.3±5.4	< 0.001
Interpersonal support	19±5.4	28.3±5	< 0.001
Mental stress management	18.8±4.3	19.3±3.4	0.479
Total score of HPLP questionnaire	126.7±21.2	151.3±18	< 0.001

As listed in Table 1, there was a significant difference between the components as it shows that educational intervention improved the lifestyle of patients with osteoarthritis after knee replacement surgery. However, concerning stress management, there was no significant difference between the two groups of intervention and control; in other words, the educational intervention did not affect this variable (P> 0.05).

DISCUSSION

The most important finding of this study was that training patients regarding lifestyle factors could improve their lifestyle for TKA.[25] Yunis et al. also showed a significant relationship between lifestyle modification and educational intervention.[26] In other words, the research hypothesis based on improving patients' lifestyles undergoing TKA followed by training was confirmed. The issue of lifestyle in the prevention and treatment of many diseases is fundamental to the extent that in some cases, the sole purpose of aggressive treatment measures and complex surgeries is to improve the patient's lifestyle and increase their satisfaction.[27] However, lifestyle and its components do not receive the attention it merits, and this issue remains unnoticed in the treatment of many diseases and problems. One of the crucial issues related to lifestyle is its role in improving patients' lifestyle that is evaluated, especially in patients undergoing TKA. Accordingly, the present study evaluated the effect of education on patients' lifestyles requiring TKA. The patients' lifestyle was significantly improved in terms of different components of health responsibility, physical activity, nutrition, self-actualization, and interpersonal support. Despite studies that confirm the relation between training and enhancing patient lifestyle, the results showed that training

offered to the patients had no impact on improving the composition of the ability to manage mental stresses. However, Madore and Henje's studies showed that behaviors based on a healthy lifestyle played a crucial role in reducing patients' stress, anxiety, and depression.[28, 29] One of the reasons in this context is the heavy surgical process of TKA and the long rehabilitation period that can significantly cause stress disorder and it is better to assess this component in the medium-term or long-term follow-ups. It is likely that over time and with the improvement of the patient's condition, the adverse psychological effects of surgery and fears of the patient will decrease, and the patient will have the ability to manage these pressures. In addition, it appears that financial pressures resulting from the purchase of prostheses and surgical supply costs are essential areas of creating stress for patients.

On the other hand, given the aging population of Iran and the fact that knee osteoarthritis is an erosion phenomenon that increases with aging and since there is no specific treatment for it, preventive behaviors and promoting a healthy lifestyle can play an important role in delaying this problem. It has been shown that preventive behaviors can play an essential role in relieving knee OA symptoms and improving the patient's performance. For example, Urquhart reported that physical activity reduced the risk of knee osteoarthritis.[30] Edwards et al. stated there was a significant relationship between physical performance and the risk of osteoarthritis.[31] In addition, Bennell reported that in patients with knee joint osteoarthritis, increasing physical activity and reducing weight could promote lifestyle.[32]

According to these findings, it is clear that changing lifestyle and adopting preventive behaviors can be very effective in preventing or improving knee OA in patients. It seems that behavioral interventions are essential to avoid the complications of this phenomenon including pain, disability, and eventually decreased quality of life. Thus, this critical health problem must be a priority in health programs, and training interventions should be designed proportionally to their needs at different stages of change. Studies have shown the role of education in raising awareness and seeking improvement in the lifestyle of patients with knee OA. Coleman et al. claimed that organizing a training course on knee OA for patients significantly reduced pain based on a linear visual scale of pain and exhibited performance improvements based on the WOMAC SF-36 questionnaires.[20]

Aydin et al. showed that training before total knee or basin arthroplasty could have an essential role in improving treatment outcomes because this training reduces the patients' anxiety and creates realistic expectations.[21] Another study announced that training was efficient in making dietary changes and increased physical activity and exercise [33] and the score of lifestyle was significantly increased after training compared to pre-training.[34] It demonstrated that the people with overweight status and with more knowledge of nutritional status and know how to modify and adjust it, in addition to the greater cooperation with the health care team, achieved better behavior change in lifestyle modification programs.

Ding et al. showed that educational interventions could significantly reduce anxiety.[35] According to these studies and the findings of the present study, the awareness of the importance of education in this field by health staff, managers, and officials could prove the crucial role of education in improving patients' lifestyles. As observed in this study, many patients did not have a normal lifestyle before surgery, whereas their lifestyle was significantly

improved after training. Now, training about the hazards of harmful behaviors and the interests of protective health-based behaviors is essential to achieve necessary self-care in patients and overcome barriers to behavior alteration in lifestyle.

CONCLUSIONS

The findings of this study showed that educational intervention has a significant impact on improving the lifestyle of patients with knee osteoarthritis undergoing a joint replacement surgery and it can have a special place in the treatment protocol of these patients. Thus, before surgery and in the acute period after surgery, the patient's awareness level regarding preventive and harmful behaviors can be increased using face-to-face training, which can be associated with significant lifestyle improvement. Of course, the offered training did not affect stress management components that need further evaluation by future studies.

LIMITATIONS

Like other studies, this study has limitations. The most important limitation of this study was the lack of a control group, which needs be addressed by future studies. In addition, studying a larger group of patients with a longer follow-up period can yield reliable results. Another limitation was the probable inaccuracy of the participants in answering the questions that affected the result of the research. In addition, each patient's lifestyle, the extent of their understanding of the education performed, individual differences, and different expectations of lifestyle and lifestyle education might have affected the outcome of the research.

RECOMMENDATIONS

Researchers' experiences suggest that patients with knee osteoarthritis are repeatedly referred to physicians due to severe pain and disability and impose high costs on their families and society. Therefore, training can have an essential role in reducing these treatment costs. Finally, education in the field of a healthy lifestyle is accompanied by reducing the incidence of knee osteoarthritis, improving the clinical status, and increasing the life expectancy of people. Researchers hope that the findings of this study could be used as a guideline for the patients and stakeholders in society, as controlling and monitoring health issues and healthy lifestyles promote public health.

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CONFLICTS OF INTEREST

Nothing to declare

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